

Claims

- [c1] 1.A pre-crash sensing system coupled to a countermeasure system having at least a first countermeasure and a second countermeasure comprising:
a vision system generating an object size signal and an object distance signal;
and
a controller coupled to said vision system for deploying either said first countermeasure or said first and second countermeasures in response to said object distance signal and said object size signal.
- [c2] 2.A system as recited in claim 1 wherein said vision system comprise a stereo pair of cameras.
- [c3] 3.A system as recited in claim 1 wherein said object size comprises height.
- [c4] 4.A system as recited in claim 1 wherein said object size comprises object area and object height.
- [c5] 5.A system as recited in claim 1 further comprising a vehicle speed sensor generating a speed signal corresponding to the longitudinal speed of the vehicle; wherein said controller activates said countermeasure system in response to the longitudinal speed signal.
- [c6] 6.A system as recited in claim 1 further comprising a decision zone; wherein said vision sensor detects an object and generates an object distance signal from an object within said decision zone.
- [c7] 7.A method for operating a pre-crash sensing system for an automotive vehicle having a countermeasure system, said method comprising:
establishing a decision zone relative to the vehicle;
detecting an object within the decision zone using a vision system;
determining an object distance and relative velocity using a vision system;
determining an object size; and
activating the countermeasure system in response to the object size and relative velocity.
- [c8] 8.A method as recited in claim 7 wherein determining object size comprises

determining an object height; wherein activating the countermeasure system in response to the object size comprises activating the countermeasure system in response to the object height.

[c9] 9.A method as recited in claim 7 wherein determining an object size comprises determining an object cross-sectional area; wherein activating the countermeasure system in response to the object size comprises activating the countermeasure system in response to the object cross-sectional area.

[c10] 10.A method as recited in claim 7 wherein determining an object size comprises determining an object cross-sectional area and object height; wherein activating the countermeasure system in response to the object size comprises activating the countermeasure system in response to the object cross-sectional and object height.

[c11] 11.A method as recited in claim 10 wherein determining an object cross-sectional area comprises determining the object cross-sectional area with a vision system.

[c12] 12.A method as recited in claim 7 wherein detecting an object within the decision zone comprises detecting the object within the decision zone with a stereo pair of cameras.

[c13] 13.A method as recited in claim 7 wherein prior to the step of activating, choosing the first countermeasure or the first countermeasure and the second countermeasure in response to said object size.

[c14] 14.A method as recited in claim 7 wherein determining an object size comprises determining the vehicle orientation; wherein activating the countermeasure system in response to the object size comprises activating the countermeasure system in response to the object size and vehicle orientation.

[c15] 15.A method as recited in claim 7 further comprising establishing a decision zone in front of the vehicle.

[c16] 16.A method as recited in claim 15 further comprising detecting an object within the decision zone; and activating the countermeasure in response to

detecting an object within the decision zone.

[c17]

17.A method as recited in claim 7 wherein activating the countermeasure system comprises activating a first countermeasure comprising pre-arming airbags and pretensioning motorized belt pretensioners, or activating the first countermeasure and a second countermeasure wherein said second countermeasure comprises adjusting the host vehicle suspension height in response to object size and orientation.

17.A method as recited in claim 7 wherein activating the countermeasure system comprises activating a first countermeasure comprising pre-arming airbags and pretensioning motorized belt pretensioners, or activating the first countermeasure and a second countermeasure wherein said second countermeasure comprises adjusting the host vehicle suspension height in response to object size and orientation.